CLAIMS

1. A method for producing a cell that secretes insulin comprising:

a) obtaining a cell that does not produce insulin; and,

b) incubating the cell with media containing high glucose, wherein the cell secretes insulin.

2. The method of claim 1, wherein the cell is transdifferentiated into an insulin-producing cell.

3. The method of claim 2, wherein the cell is transdifferentiated into a pancreatic cell.

4. The method of claim 3, wherein the cell is trandifferentiated into a pancreatic beta cell.

5. The method of claim 1, wherein the cell that does not produce insulin is an undifferentiated cell.

6. The method of claim 5, wherein the undifferentiated cell is a human cell.

7. The method of claim 6, wherein the cell was obtained from cord blood or tissue.

8. The method of claim 6, wherein the cell was obtained from placental blood or tissue.

9. The method of claim 6, wherein the human cell is an autologous cell.

10. The method of claim 5, wherein the undifferentiated cell is a stem or progenitor cell.

11. The method of claim 6, wherein the undifferentiated cell is a multipotent cell, a totipotent cell, or a hematopoietic cell.

12. The method of claim 11, wherein the undifferentiated cell is a hematopoietic cell.

13. The method of claim 12, wherein the hematopoietic cell is capable of differentiation into a dendritic cell, a granulocyte, an erythroid cell, a monocyte, a B cell, or a T lymphocyte.

14. The method of claim 5, wherein the undifferentiated cell expresses CD34.

15. The method of claim 5, wherein the undifferentiated cell does not express CD38.

16. The method of claim 14, wherein the undifferentiated cell also expresses one or more of the following cell surface markers selected from the group consisting of: CD10, CD29, CD44, CD54, CD90, SH2, SH3, SH4, OCT-4, and ABC-p.

17. The method of claim 14, wherein the cell does not express one or more of the following cell surface markers selected from the group consisting of: CD38, CD45, SSEA3, and SSEA4.

18. The method of claim 1, wherein the media contains at least 10 mM glucose.

19. The method of claim 18, wherein the media contains at least 25 mM glucose.

20. The method of claim 1, wherein the media further comprises a lipoprotein.

21. The method of claim 20, wherein the lipoprotein is high density lipoprotein (HDL), low density lipoprotein (LDL), lipoprotein (a), or very low density lipoprotein (VLDL).

22. The method of claim 1, wherein the media further comprises at least one of β-mercaptoethanol, stem cell factor, TPO, IL-3, Flt-3, or LIF.

23. The method of claim 20, wherein the media further comprises at least one of β-mercaptoethanol, stem cell factor, TPO, IL-3, Flt-3, or LIF.

24. The method of claim 6, wherein the media further comprises at least one additional compound in an amount sufficient to promote transdifferentiation of the undifferentiated cell into the cell that secretes insulin.

25. The method of claim 24, wherein the additional compound is a lipoprotein.

26. The method of claim 25, wherein the lipoprotein is low density lipoprotein.

27. The method of claim 6, wherein the additional compound is low density lipoprotein, β-mercaptoethanol, stem cell factor, TPO, IL-3, Flt-3, or LIF.

28. The method of claim 6, wherein the media further comprises low density lipoprotein, β-mercaptoethanol, stem cell factor, TPO, IL-3, Flt-3, and LIF in amounts sufficient to promote transdifferentiation of the undifferentiated cell into the cell that secretes insulin.

29. The method of claim 1, wherein the cell is incubated in media containing glucose for at least 5 days.

30. The method of claim 1, wherein the media further comprises insulin.

31. The method of claim 30, wherein the insulin is present in an amount sufficient to promote transdifferentiation of an undifferentiated cell into the cell that secretes insulin.

32. The method of claim 31, wherein the insulin is human insulin.

33. The method of claim 1, further comprising propagating the cell prior to incubation in high glucose.

34. The method of claim 33, wherein the propagation comprises passaging the cell at least once.

35. The method of claim 1, further comprising recombinantly engineering the cell to reduce or prevent an immune response to the cell after the cell is administered to the patient.

36. The method of claim 35, wherein the cell is recombinantly engineered to reduce or prevent the presence of one or more cell surface protein on the cell.

37. The method of claim 36, wherein the cell surface protein is a human leukocyte antigen (HLA) protein.

38. A method for propagating a CD34+ cell or a stem or progenitor cell in culture comprising:

a) obtaining a CD34+ cell; and,

b) incubating the cell in a media comprising insulin and/or lipoprotein.

39. The method of claim 38, wherein the cell is a cord blood or placental cell.

40. The method of claim 38, wherein the number of total cells in the culture increases more than two-fold.

41. The method of claim 38, further comprising:

c) concentrating leukocytes from a cord blood sample;

d) selecting stem cells using a CD34 protein marker prior to incubating

stem cells with a media comprising insulin and/or lipoprotein, wherein the number of stem cells increases.

42. A composition comprising an insulin-producing cell in a high glucose media containing insulin and/or lipoprotein.

43. The composition of claim 42, wherein the high glucose media comprises at least 25 mM glucose.

44. A method for treating diabetes in a patient comprising:

a) administering to the patient an effective amount of transdifferentiated cells producing insulin.

45. The method of claim 44, wherein the cells are derived from the patient.

46. The method of claim 44, wherein the patient is also administered one or more immunosuppressing agents.

47. The method of claim 44, wherein the cells have been engineered to reduce or prevent expression of one or more cell surface proteins.